

January 5, 2017
Old Fort William Cottagers' Association
Fort William, Municipality of Sheenboro, Quebec

Re: CNL at Chalk River

In July 2016, the Old Fort William Cottagers' Association (OFWCA) formed a sub-committee specifically regarding CNL's (Canadian Nuclear Laboratories) proposals and activities at Chalk River, Ontario. The main focus is CNL's proposal for a Near Surface Disposal Facility (NSDF) for the long-term disposal of low and intermediate-level radioactive waste on the Chalk River site.

As Fort William is just downriver from Chalk River, we are particularly concerned about any and all proposals, plans and activities that are taking place and are being considered for the future. The health and wellbeing of our community is very dependent on what transpires at Chalk River now and in the future, as this site is on the banks of the Ottawa River upon which our community depends.

OFWCA members understand that CNL must adopt a long-term plan for the radioactive waste that has accumulated on the site for half a century. However, our members are very disturbed to learn that CNL also plans to transport radioactive waste and other waste from different areas of the country to Chalk River for disposal. We find it unacceptable to turn this site into a huge area for disposing of radioactive material from other parts of the country.

Thus the Old Fort William Cottagers' Association adopted the following resolution regarding CNL at Chalk River:

OFWCA strongly objects to Chalk River (CNL) receiving and accepting radioactive waste and any other waste from another site outside the Chalk River facility. Disposal of radioactive waste and any other waste must be limited to Chalk River's current levels of generated radioactive waste.

The Municipality of Sheenboro adopted a similar resolution in December. Sheenboro and the OFWCA stand together in opposing radioactive waste coming to Chalk River from other locations.

The OFWCA sub-committee has undertaken to write a background document about CNL at Chalk River, their mandate and proposals in order to inform as many people as possible about their plans. We respectfully submit this document below.

CNL at Chalk River

Introduction

In March 2016, CNL (Canadian Nuclear Laboratories) submitted a proposal for a Near Surface Disposal Facility (NSDF) to permanently dispose of up to one million cubic metres of radioactive waste at Chalk River, Ontario. This would include radioactive waste transported from all over Canada in addition to waste already in interim storage at the site.

While the original project description for the NSDF specified that it would contain only low-level radioactive waste and “mixed waste”, a revised project description, issued in October 2016, proposed that intermediate-level radioactive waste would also be included in this disposal facility. Intermediate-level waste has greater levels of radioactivity, contains higher concentrations of longer-lived radionuclides, and requires shielding during handling and transport.

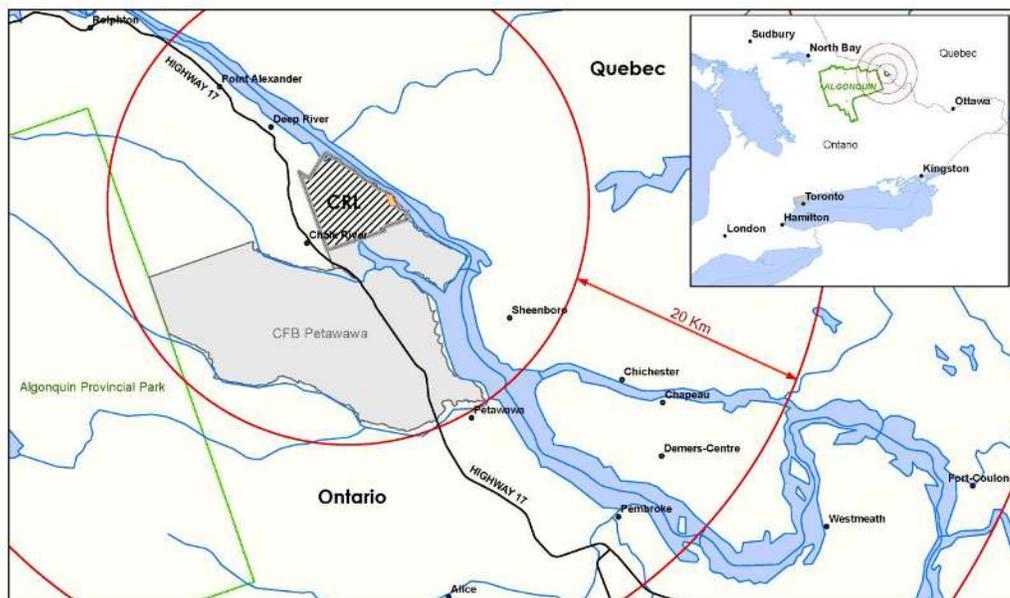
The process for approval of this project is already underway and there is limited time to react. CNL’s proposal requires approval by the Canadian Nuclear Safety Commission (CNSC). The formal environmental assessment process was launched in May 2016 for the NSDF at Chalk River. By March 2017, a draft environmental impact statement is expected after which there will be a 60-day comment period for the public. It is projected that the final environmental impact statement will be completed by November 2017 and ready for CNSC approval. CNL’s goal is to begin construction in 2018 and to commence operations in 2020.

The Old Fort William Cottagers’ Association strongly objects to bringing in additional radioactive waste from all over Canada to the Chalk River site. We believe also that disposing of huge quantities of radioactive waste in a location that lies directly on the Ottawa River, is almost entirely surrounded by water and is in a seismic zone needs serious deliberation. If this disposal site includes radionuclides with long half-lives, it will remain hazardous for hundreds of thousands of years. Even the most brilliant scientists cannot predict what will transpire in such a period of time. Radioactive contamination of the Ottawa River will affect all communities along this great river. The health of the river and of the people living on or near the river relies on Quebec’s and Ontario’s protection of this magnificent resource.

It is during these next few months that the public needs to be informed. We must act now to increase awareness about this project so that all voices may be heard.

We urge mayors and municipal councils in proximity to the Ottawa River to inform their communities about CNL's proposals. We call on all political parties, ministers responsible for the environment, Ontario's MPPs and MPs and Quebec's MNAs and MPs representing people living along the Ottawa River to question CNL's proposal and to present their own views. There must be pressure exerted on CNL, the Canadian Nuclear Safety Commission (CNSC) and the federal government to ensure that the most **stringent** possible environmental standards are used to protect the Ottawa River, the environment and local communities living along the river. Many citizens will be affected by the decisions that take place at CNL, Chalk River.

Where is CNL located? Why is this location so significant?



CNL is in Renfrew County, Ontario, on the banks of the Ottawa River. The site is about 4000 hectares and is almost entirely surrounded by water. According to the Natural Resources Department, Chalk River lies in the western Quebec seismic zone and could experience earthquakes of 6 on the Richter scale.

Garrison Petawawa is on the southern border and the Village of Chalk River, in the Municipality of Laurentian Hills, lies immediately to the southwest of the site. Deep River is upstream to the northwest, and the Town of Petawawa and the City of Pembroke are downstream to the southeast. According to the Canadian 2011 Census, the combined population of Petawawa and Pembroke was 32,000 people.

The province of Quebec lies directly across the Ottawa River from CNL. Fort William and Sheenboro, in the Municipality of Sheenboro, are the first communities downriver followed by Chichester, Chapeau, and Fort Coulonge, all in Pontiac County. This is cottage country with hundreds of cottages along the river. According to the Canadian 2011 Census, the population of Pontiac was 21,386 residents mostly located along the Ottawa River.

Ottawa and Gatineau-Hull are approximately 200 km southeast. Further southeast is Montreal.

The Ottawa River thus divides the provinces of Quebec and Ontario and millions of citizens depend on this river for their drinking water. Radioactive contamination of the river would affect them all.

<http://www.earthquakescanada.nrcan.gc.ca/zones/eastcan-en.php#NEOSZ>

Radioactive wastes sites area, CNL at Chalk River – Google Map



CNL site surrounded by water

Was it a good decision to turn Canada's nuclear industry over to private companies?

To allow Canada to compete in the global nuclear energy market, the Harper government proposed in 2007 a review process to restructure Atomic Energy of Canada Limited

(AECL). Following the review, in 2009, the federal government initiated a six-year process of restructuring AECL's two divisions: the Nuclear Laboratories and the CANDU Reactor Division, to a government-owned, contractor-operated (GoCo) model. In preparation for the transition to a GoCo model, a new entity CNL (Canadian Nuclear Laboratories) was created in 2014. All licenses for the operation of Chalk River Laboratories were transferred from AECL to CNL.

In June 2015, a consortium of five nuclear engineering and technology companies (including SNC-Lavalin) from the U.S., U.K., and Canada was chosen to manage and operate CNL with the main objectives of decommissioning, managing Canada's radioactive waste and performing science and technology activities. Though the Chalk River site remains federal property under the ownership of AECL, it is now managed and operated by private companies. It is "government-owned, contractor-operated".

This is of great concern as private companies tend to be interested in their bottom line and making profits. These companies will be managing operations at Chalk River on a 10-year contract. They will make profits for a number of years but they will not be invested in Chalk River for a hundred years. Who will then be responsible and pay what is necessary if there is a future leak or worse? For any future expenses incurred it will be the taxpayers of Canada who will be liable.

[Archived – Restructuring of Atomic Energy of Canada Limited – Nuclear Laboratories
\[http://news.gc.ca/web/article-en.do?
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<http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/snc-takes-charge-of-canadas-nuclear-future/article589323/>

2015 \$55 million to Chalk River (hydrogen isotopes - hydrogen, deuterium and tritium)
[http://www.labcanada.com/laboratory/chalk-river-nuclear-science-lab-gets-55m-upgrade/
1003429802/](http://www.labcanada.com/laboratory/chalk-river-nuclear-science-lab-gets-55m-upgrade/1003429802/)

<http://ottawacitizen.com/news/local-news/snc-lavalin-consortium-chosen-to-run-chalk-river-nuclear-lab>

Western Quebec seismic zone

<http://www.earthquakescanada.nrcan.gc.ca/zones/eastcan-en.php#NEOSZ>

CNL's Mandate

CNL's three key mandates are decommissioning and managing radioactive waste, performing scientific and technology activities supporting Canada's nuclear industry, and engaging in commercial ventures with industry.

Decommissioning

The National Research Universal (NRU) reactor that has been in operation since 1957 at Chalk River will shut down in March 2018 and will eventually be decommissioned. The license was to expire in October 2016 but was extended until 2018. It is here that six types of radioactive isotopes for nuclear medicine have been produced, some using highly enriched uranium (HEU), known as weapons-grade uranium. About seven kilograms of HEU were transported under heavy guard over roads from the U.S. to Chalk River each year.

There have been breakdowns, accidents, and leaks at the NRU reactor. In December 2008 there was a spill of highly radioactive heavy water. This accident and a continuing leak of 7,000 litres of radioactive water were not immediately reported to the public. Dr. Ole Hendrickson of Concerned Citizens of Renfrew County called it a very serious situation saying that the health and safety of citizens as well as the environment were at risk.

Radioactive tritium has also routinely been released into the air and water increasing the risk of cancer and birth defects and other illnesses. Radionuclides continue to leak into the Ottawa River from the "fuel bay" that holds the spent fuel rods from the NRU reactor. Large areas of soil and wetlands are contaminated. The Sierra Club of Canada documents that Chalk River has become Canada's most contaminated nuclear site and threatens the drinking water of millions of Canadians living downstream.

A number of factors were part of the decision to decommission NRU. The advanced age of the reactor and great concerns about safety were major reasons. Non-proliferation commitments and the fear of nuclear terrorism were also part of this decision. Canada committed at the global security summit in 2015 to cease using highly enriched, weapons-grade (HEU) uranium for isotope production. Scientists are now developing alternative methods for isotope production that do not require a reactor and do not create high-level radioactive waste.

The NRU reactor will be shut down in 2018 and placed in a state of storage. Decommissioning operations will continue for years. High-level radioactive waste has been accumulating over many years and it will not disappear for at least 400,000 years. It is unclear what the plan is for this highly dangerous waste.

Most current proposals for dealing with highly radioactive waste involve burying it in deep underground sites. An intense search has been going on in Ontario for a number of years for a site to build a deep geological repository (DGR) for high-level radioactive waste. The projected cost of such a DGR at today's prices is about \$23 billion and the plans are extremely controversial.

<http://ottawacitizen.com/news/n/nru-timeline>

<http://ottawacitizen.com/news/politics/historic-nru-reactor-to-close-in-2018>

<http://www.archive.sierraclub.ca/en/node/1319>

<http://ottawacitizen.com/news/local-news/expanded-medical-isotope-production-part-of-chalk-river-legacy>

<http://www.globalresearch.ca/radioactive-water-from-nuclear-plant-contaminates-ottawa-river/17104>

Managing Radioactive Waste Near Surface Disposal Facility (NSDF)

The CNL project proposal for the Near Surface Disposal Facility (NSDF) for permanent disposal of radioactive waste at the Chalk River site is concerning. The original proposal submitted in March 2016 by CNL specified that the NSDF would only contain low-level radioactive waste, some of which might be mixed with non-radioactive hazardous wastes ("mixed waste"). However, a revised project description issued in October 2016 states that intermediate-level waste and radioactively contaminated mixed wastes will also be included in this disposal facility.

The proposal to include intermediate-level waste is a concern as intermediate-level waste has greater levels of radioactivity and contains higher concentrations of long-living radionuclides. According to the Canadian Nuclear Safety Commission, some intermediate-level radioactive waste may require containment for periods well beyond several hundred years.

CNL indicates that intermediate-level radioactive waste will be limited to 1% (10,000 cubic metres) of the total capacity of the disposal facility and requires shielding for safe handling and placement. CNL states "all waste will meet the Waste Acceptance Criteria (WAC) for the NSDF". However, the WAC has not yet been defined. So what will be included is not clear. How CNL will address higher levels of containment and isolation is not specified.

CNL also plans to transport radioactive waste to this NSDF at Chalk River from Port Hope, Ontario (once their long-term waste management facilities are closed), Whiteshell Laboratories in Manitoba, Gentilly-1 in Quebec, Douglas Point in Kincardine, Ontario, and NPD in Rolphton, Ontario. Nuclear reactors at these last four sites are in various stages of decommissioning. CNL estimates that about 50,000 cubic metres of waste will come from Whiteshell and Rolphton. It is unknown at this time how much waste would come from these other areas as projects are still in their proposal stages and no final decisions have been made. Radioactive waste will also be transported from hospitals, universities, and other commercial enterprises across the country for disposal.

CNL claims that such an NSDF is “proven” technology. However, the sites that CNL references in the September 2016 Project Description do not seem comparable and their operations commenced roughly fifteen to twenty years ago making their experience short.

This would be the first site in Canada for the permanent disposal of wastes arising from nuclear reactor operations. The NSDF is described as a multiple system of liners using both natural and synthetic materials that is then covered by a mound of radioactive and mixed wastes. It will include monitoring and security systems. Because radioactive and other hazardous wastes will be exposed to the environment during the operational phase of the NSDF, water, in the form of precipitation, will be collected from the NSDF and treated before being released into the environment. The NSDF is expected to be operational for fifty years.

What is included in mixed radioactive wastes?

Mixed wastes are not specified in the proposal. CNL has confirmed though that approximately 1% (10,000 cubic metres) of the radioactive waste will be mixed wastes. These mixed wastes are hazardous wastes that are radioactively contaminated and some may contain PCBs, mercury, and arsenic. The Waste Acceptance Criteria will ultimately determine the actual quantities.

How large will this NSDF be?

It is stated that the NSDF at Chalk River will host up to **one million cubic metres of radioactive waste**. According to Theresa McClenaghan of the Canadian Environmental Law Association, a million cubic metres is four times the currently recommended capacity for a low and intermediate-level waste facility. Imagine such a huge area of radioactive waste right next to the Ottawa River and on land that is virtually surrounded by water.

The claim is that the NSDF will be a solution not only for historical waste but also for newly generated waste as the plan is to revitalize Chalk River’s laboratories. Demolition debris from the many buildings and laboratories that CNL will tear down on the Chalk River site in order to build new facilities will be added to the NSDF.

This project is not only to clean-up the radioactive waste already on site but provides a new commercial opportunity for CNL and its private owners to import radioactive waste from other places.

The NSDF may be safer than the interim storage facilities currently used for radioactive waste. Certainly Chalk River must find some solution for the radioactive waste that exists there at present. But the idea of transporting tons of radioactive waste from other areas of the country to this vulnerable area on the banks of the Ottawa River seems surreal. Using this site as a dumping ground for radioactive waste from other parts of the country is unacceptable.

<http://www.cela.ca/blog/2016-08-02/ottawa-river-best-kept-secret>

<http://www.cnl.ca/en/home/environmental-stewardship/nsdf/default.aspx>

<http://www.thedailyobserver.ca/2016/07/07/cnl-unveils-two-projects>

<http://www.cnl.ca/site/media/Parent/PSA-NSDF-Eng.pdf>

Oct. 19/2016 Intermediate-level waste added to proposal

<http://www.ceaa-acee.gc.ca/050/documents/p80122/115905E.pdf>

Why is the Chalk River site being chosen for the NSDF?

As Chalk River is situated in a major seismic zone and could experience earthquakes of 6 on the Richter scale, it is hard to believe that the site was chosen for geological reasons. Is it because the local municipalities are willing hosts for the NSDF and there is little resistance from them? Does the relatively small population on both sides of the river near Chalk River make it convenient politically as there are few opposing voices?

The population in Quebec near Chalk River has been understated in reports. The local community both permanent and seasonal residents (including Sheenboro, Chichester, and L'Isle-aux-Allumettes) is nearly 3,500 people not 100 as stated in reports. The overall population of Pontiac County is composed of more than 21,000 residents primarily living along the Ottawa River. Quebec voices must be heard.

On the Ontario side of the Ottawa River, Garrison Petawawa has approximately 6,000 personnel living near the river. In 2011 the population of the Town of Petawawa was nearly 16,000 and the City of Pembroke's population was also about 16,000, with another 10,000 people in the adjacent municipality of Laurentian Valley. Ontarians must make their voices heard.

Municipalities near the site tend to be swayed by the promise of jobs and substantial financial investments. Can they be objective in their assessment of the environmental

impact? The 2016-2017 federal budget allocated \$969 million to Atomic Energy of Canada Limited, including \$529.8 million for decommissioning and waste management at all federal nuclear sites (including Chalk River) and \$438.8 million for operations of the nuclear laboratories at CNL's Chalk River site. In April 2016 the Trudeau Government announced a specific allocation of \$800 million in new capital infrastructure for CNL over the next five years.

If financial considerations and jobs are the main focus of local municipalities, then people and governments further afield must make the environment, the health of the Ottawa River and its people the primary consideration. Jobs and economic opportunities are certainly important but not at the price of the contamination of the environment. People's health and lives could be seriously at risk. We count on all levels of government to be informed and to assess the plans and activities of CNL at Chalk River because of the great potential for long-term nuclear contamination.

www.tbs-sct.gc.ca/hgw-cgf/finances/pgs-pdg/gepme-pdgbpd/20162017/me-bpd-eng.pdf

<http://www.thedailyobserver.ca/2016/04/13/chalk-rivers-cn-l-to-receive-800-million-in-new-infrastructure-money>

Are there plans for a deep geological repository (DGR) at Chalk River?

It was reported in 2012 that the AECL had been considering for some years the possibility of building a DGR at Chalk River to bury low and medium-level radioactive waste that had been accumulating on the site for six-decades. This DGR would have been used also for radioactive waste from across the country. The proposed cavern would have been 500 metres below ground. AECL undertook a \$30 million feasibility study for the construction of this DGR. There was considerable resistance to this plan, with Concerned Citizens of Renfrew County leading the opposition. Diagrams showed that radioactive wastes, arsenic, and other toxic materials would leak from this DGR and contaminate the Ottawa River within decades.

CNL has confirmed that there are no plans for a DGR at Chalk River at this time.

2012

<http://www.therecord.com/news-story/2599469-radioactive-waste-may-be-buried-at-chalk-river/>

Aug. 2013 Ole Hendrickson DGR Joint Review - Environment Impact
<https://www.ceaa-acee.gc.ca/050/documents/p17520/93220E.pdf>

The Environmental Assessment and the Canadian Nuclear Safety Commission (CNSC)

An Environmental Assessment (EA) of CNL's proposal is required and the CNSC must approve the proposal.

The formal EA process was launched in May 2016 for the NSDF at Chalk River. A draft Environmental Impact Statement (EIS) is expected in March 2017. After this there will be a 60-day comment period for the public. It is expected that the final EIS will be released in November 2017. An additional 60-day comment period will follow. The EIS will then be ready for approval by CNSC in January 2018. CNL hopes to begin construction by 2018.

Public presentations have been held by CNL in the communities closest to Chalk River. However, they seem to be planned, at least in Quebec, when many seasonal residents are not there. The presentation in the spring of 2016 in Sheenboro, Quebec from many accounts was highly unsatisfactory. Another presentation was held in Sheenboro in October. The reviews were mixed. Apparently, there are no information sessions planned for Gatineau-Hull, Ottawa, or Montreal. Surely all people living on the Ottawa River or depending on the river should be informed so they can make an educated input to the environmental assessment.

How comprehensive is the environmental assessment process?

Can we count on the EA process to protect the Ottawa River and all people living and depending on the river from Chalk River to Montreal?

Dr. Ole Hendrickson, of Concerned Citizens of Renfrew County, points out in a recent submission the considerable weaknesses in the federal environmental assessment process. In 2012 the Harper Government repealed and replaced the 1992 Canadian Environmental Assessment Act (CEAA). The scope of the federal environmental assessment process was drastically reduced. In the new Act consideration of environmental effects is limited to effects on fish and fish habitat, aquatic species at risk, and migratory birds.

This is in stark contrast to the previous 1992 Act that considered effects to all aspects of the environment: land, water, air, organic and inorganic matter, and included impacts on health and social-economic conditions. Public participation is severely curtailed in the current CEAA. The term "public" was not restricted in the previous Act. Now the term public means that only those who are directly affected (i.e. living in the immediate vicinity?) can comment in the EA process. The timeline for public comment is also significantly reduced. The Canadian Environmental Law Association views the 2012 Act "as an unjustified and ill-conceived rollback of federal environmental law".

On a positive note, the federal government is currently proceeding with a highly

anticipated review of the federal environmental process and the 2012 Act. An Expert Panel is undertaking public consultations and will file a report in January 2017.

Environmental assessments need to be comprehensive and the public must be enabled to participate fully. We must demand a stringent environmental process. Our federal Liberal government must take a stand in defence of the environment. The health of our river and the health and lives of people depend on it.

<http://www.cela.ca/sites/cela.ca/files/CELA-Comments-Expert-PanelTOR.pdf>

November 2016, Dr. Ole Hendrickson's submission re: Environment Assessments
<http://eareview-examenee.ca/view-submission/?id=1478533020.4154>

<http://www.cela.ca/collections/justice/canadian-environmental-assessment-act>

<http://www.lawnow.org/canadian-federal-environmental-assessment-law/>

Is the CNSC doing its job? Should Dr. Michael Binder be the chief?

Assurances from the CNSC that all is safe at Chalk River are not reassuring. The CNSC was established to oversee and to regulate all nuclear facilities in Canada. The CNSC apparently is not a reliable watchdog. In the spring of 2016, whistleblowers (employees of CNSC) signalled that the CNSC was withholding information and failing to comply with the required inspection process. Dr. Binder, the executive director of CNSC, instead of taking these accusations seriously, called them a “sham” and a “conspiracy”. In October 2016, Julie Gelfand of the Commission of Environment and Sustainable Development released an audit concluding that only 48% of required inspections were conducted by the CNSC.

Thomas Mulcair has questioned Justin Trudeau on his support of Dr. Binder. Elizabeth May has expressed concern. Critics claim that Dr. Binder acts like the nuclear industry's “cheerleader” as he repeatedly defends and dismisses possible dangers. Others have called the relationship between the nuclear industry and the CNSC “incestuous”. Shawn Patrick Stensil of Greenpeace believes there is a lax safety culture within the CNSC and that there is a “scary parallel” between the claims of the whistleblowers and the catastrophe at Fukushima (Japanese officials have admitted that there were inadequate inspections over the years prior to the nuclear disaster at Fukushima).

Dr. Binder was appointed head of the CNSC in 2008 by Stephen Harper after the former prime minister had fired Linda Keen claiming that she had undermined the public's confidence in nuclear safety. Linda Keen had ordered the shutdown of the NRU at Chalk River in 2007 when CNSC inspectors discovered that a major upgrade had not been done. However, her authority was by-passed and the NRU was restarted before the necessary

work was completed.

<http://www.theglobeandmail.com/news/politics/critics-accuse-nuclear-safety-official-acting-as-industry-cheerleader/article32341301/>

<http://www.theglobeandmail.com/news/politics/anonymous-letter-claims-info-on-nuclear-risks-withheld-from-safety-commissioners/article30964195/>

<http://www.nationalobserver.com/2016/08/18/news/canadian-nuclear-boss-jokes-about-whistleblowers-and-muzzles-environmentalist>

It is very disturbing that the current federal environmental assessment process and the CNSC's role as the nuclear "watchdog" are severely inadequate.

What are the questions and concerns that are being raised by scientists, experts and environmentalists regarding CNL's proposals for NSDF and decommissioning NRU?

The Waste Acceptance Criteria and the Environmental Impact Statement (EIS), including both the Safety Analysis Report and the Performance Assessment, are currently being developed by CNL. The EIS must analyze severe abnormal situations (some of which are mentioned below) and demonstrate how people and the environment will be protected in those circumstances. It will be critical for independent scientists, experts and environmentalists to scrutinize these documents and to determine that the answers provided are adequate in order for this project to proceed.

Brennain Lloyd of Northwatch stated in a submission to the CNSC regarding CNL's March 2016 NSDF project proposal that it lacked both information and specificity. Insufficient detail about anticipated waste volumes from off-site locations was only one of many details missing in the proposal. Both Northwatch and the Canadian Environmental Law Association requested that the proposal be resubmitted with greater specificity, that AECL should be a co-proponent of the project and that the environmental assessment should be conducted by an independent review panel.

What are the potential hazards associated with the gases the wastes may generate after emplacement? And would this be monitored? Northwatch raised this question.

In a June 2016 report to the CNSC, Dr. Ole Hendrickson, a researcher and scientist with Concerned Citizens of Renfrew County, raised many questions and subjects that need to be addressed in the environmental assessment of the NSDF. Some of these questions are indicated below. Note that Dr. Hendrickson's report was written prior to CNL's October

2016 inclusion of intermediate-level radioactive waste in the NSDF proposal.

How is this new method, NSDF, going to protect the river and the thousands of people living on the river from leaks?

For years the public has been told that leaks at Chalk River into the Ottawa River are sufficiently diluted by the river and do not pose a threat to people living downstream from Chalk River. This argument is unacceptable, Dr. Hendrickson states.

Any environmental assessment of this new NSDF must examine anticipated leaks.

Is the NSDF suitable to retain such toxic materials long term?

What studies have been done? (Dr. Hendrickson's report was addressing low-level radioactive waste and "mixed wastes".)

The CNSC disclosed on Oct. 19, 2016 that CNL's NSDF proposal had been amended to include intermediate-level waste. Can it be determined that this NSDF is suitable to retain intermediate-level waste and other toxic materials long term? This NSDF is the first of its kind in Canada. It will be a trial and that is not reassuring as no one can answer what might happen over hundreds or thousands of years especially with the inclusion of intermediate-level radioactive waste.

What about liquids? How would they be retained so they do not run off into the river? CNL has indicated that no "free" liquids will be included in the NSDF.

What studies have been done to show that the materials (both natural and synthetic) that will be used in the NSDF liner system are capable of containing radioactive waste and other toxic/hazardous material?

What are the conclusions or what studies are presently being done?

Again, can this be answered? No one can know if this liner system can contain or retain radioactive waste and other toxic waste over decades never mind centuries. Other near surface facilities are not comparable and, in any case, have only been in operation for a decade or two at the most. No one can predict what will transpire.

How will the mound be identified or identifiable to future generations?

How will intermediate-level radioactive waste be isolated and contained? How will CNL ensure that all wastes meet Waste Acceptance Criteria (WAC)?

W. Turner in his submission to the CNSC in November 2016 writes that CNL needs to describe how it will provide the isolation and containment that is required for intermediate-level radioactive waste. In addition, Mr. Turner states that CNL must take the responsibility to ensure that all wastes to be emplaced within the NSDF meet the WAC whether this waste is imported from another site or comes from demolished buildings on the Chalk River site. CNL must characterize all wastes and maintain an

inventory of the total nuclides emplaced in the repository. He concludes that CNL will, therefore, “need to build, operate, and maintain a Waste Characterization Facility”.

Can the NSDF sustain a major earthquake?

If an earthquake created a leak in the liner system – what would CNL do - how would they know and how would the repairs be carried out?

According to the Natural Resources Department, Chalk River lies in the western Quebec seismic zone (an earthquake belt that surrounds the Ottawa Valley from Montreal to Temiscaming, Quebec) and could experience earthquakes of 6 on the Richter scale. Although the majority of earthquakes have been small (between 2.0 and 4.5 on the Richter scale), there have been three significant earthquakes in the past. In 1935 a powerful earthquake measuring 6.2 hit the Temiscaming area.

Raven Beck Environmental Ltd. carried out a Geological Mapping Project which mapped major fracture zones at Chalk River. It appears that there is a high probability of fracture zones on the proposed NSDF site. Dr. Ole Hendrickson concludes that the environmental assessment needs to consider the impact of seismic activity, faulting, and fracture zones on the long-term performance of the NSDF.

Northwatch Letter to CNSC

<https://www.ceaa-acee.gc.ca/050/documents/p80122/114829E.pdf>

Nov. 2016 CELA to CNSC re NSDF

<http://www.ceaa.gc.ca/050/documents/p80122/116488E.pdf>

William Turner Nov. 2016

<http://www.ceaa.gc.ca/050/documents/p80122/116478E.pdf>

June 2016 Letter from Ole Hendrickson Concerned Citizens of Renfrew County to CNSC

<http://www.ceaa.gc.ca/050/documents/p80122/114841E.pdf>

<http://www.earthquakescanada.nrcan.gc.ca/zones/eastcan-en.php#NEOSZ>

Can a radioactive leak occur due to the liners being punctured by the waste itself?

Greenpeace raised this possibility. A radioactive leak in a near surface disposal facility in the U.K. occurred and was caused by an object that had punctured a hole in the liner.

<http://www.greenpeace.org/international/en/campaigns/nuclear/waste/>

Has sabotage been considered in their plans?

What about a flood? If a dam failed upriver for some reason (an earthquake, age-related failure, sabotage, other) and there was a major flood what would happen to this site if

covered by the river water?

What about radioactive tritium being released and leaking into the Ottawa River?

The Tritium Awareness Project (TAP) points out the dangers of tritium to health. TAP states that, although tritium should be kept out of drinking water supplies, Canadian nuclear facilities are permitted to release large quantities of tritium into drinking water. Radioactive tritium has been released and has leaked into the Ottawa River for years. People need to know how tritium levels are affecting the water, the air, vegetation, wildlife and livestock, and the health of citizens in the communities downriver from the CNL site at Chalk River.

The waste treatment facility that will run continuously during the operational phase of the NSDF will not have the capability to remove tritium from the waste water stream. If significant amounts of tritium-containing wastes are placed in the NSDF this will create risks of elevated tritium releases to the Ottawa River.

The Canadian Government seems to have very lax standards regarding tritium levels. (Acceptable tritium levels in Canada: 7000 Bq/Litre vs. 100 in Europe and 14.7 in California.) It is difficult to be put at ease by statements from CNSC and CNL that no harm is being done to the environment and to people when the opinions and the results of testing by different entities are so divergent. Though CNL/CNSC monitor river water, air, soil, vegetation etc. through many samples, it seems evident that independent monitoring and sampling is essential in order for the public to have confidence.

<http://www.globalresearch.ca/radioactive-water-from-nuclear-plant-contaminates-ottawa-river/17104>

TAP Tritium Awareness Project - Tritium Primer

http://tapcanada.org/wordpress/?page_id=403

2009 Keep radioactive tritium out of our drinking water

<http://www.sierraclub.ca/national/documents/tritium-on-tap.pdf>

Will studies be carried out to test for increased cancer levels in the communities downriver?

Though apparently no official studies have been carried out to date, many residents and cottagers downriver from Chalk River are convinced that more people are suffering from various types of cancer and more babies are being born with birth defects than in the wider population. This must be studied. If the activities at Chalk River are the cause we need to know. The human tragedy could be enormous and the cost to our health care system immense.

As CNL is being revitalized and enormous sums of money are being invested in new buildings and projects, will these new facilities be generating more nuclear waste? Will radioactive material from commercial enterprises be included in the NSDF?

Commercial projects are using radioactive material. An example is SRB Technologies (a sign company in Pembroke, Ontario) that in the past has released huge quantities of tritium into the environment contaminating drinking water, gardens, animals and humans, and that continues to fill glass tubes with tritium gas. In a 2015 report, Dr. Ole Hendrickson writes that tritium levels remain as high as 60,000 Bq/Litre in the monitoring well at the base of this company's stacks in Pembroke. In addition to its tritium processing operations, SRB Technologies imports waste tritium exit signs from the United States and ships them to CNL for storage (and eventual disposal). CNL management has stated that it does not have plans to import radioactive wastes from the United States for disposal in the NSDF. However, commercial enterprises such as SRB Technologies may already import wastes from other countries that would be included in the NSDF.

<http://tapcanada.org/wordpress/wp-content/uploads/2015/05/Tritium-Behaviour-in-the-Vicinity-of-SRB-Technologies-1.pdf>

What is happening to the waste from HEU (highly enriched uranium) that has been used to produce medical isotopes?

Currently 23,000 litres of a liquid solution that is highly radioactive and contains HEU waste is being stored in the "Fissile Solution Storage Tank" (FISST) at Chalk River. CNL plans to transport this highly radioactive liquid to the Savannah River Site in the U.S. as part of Canada's commitment to global safety and non-proliferation. However, there is widespread opposition in Canada and the United States to transporting this dangerous material. A lawsuit has been launched in the U.S. calling for an injunction against the proposed shipments.

What will happen? This liquid is a disaster waiting to happen and threatens to leak into the Ottawa (imagine this). Production of the molybdenum-99 (Mo-99) medical isotope from HEU was suspended at the end of October 2016 and will resume only if the Trudeau Government determines that there is an emergency global shortage. This creates an opportunity to convert HEU wastes in the FISST to a solid form, as was done routinely during the final decade of Mo-99 production at Chalk River.

Oct. 3, 2016 Opposition to transporting highly radioactive liquid waste from Chalk River
<http://www.cela.ca/liquid-nuclear-waste-convoy>

<http://www.sierraclub.ca/en/save-canadas-environment-laws/stop-radioactive-roadtrip>

What are the plans for high-level radioactive waste from the reactors at Chalk River?

Soils and wetlands downslope from the operating NRU reactor and the non-operating NRX reactor and are contaminated with radioactive strontium-90 and tritium, owing to leaks in the “fuel bays” where high-level waste fuel rods from the reactors are (or were) stored. Radioactive waste plumes from these leaking fuel bays are currently discharging into the Ottawa River. It is unclear if cleanup of these contaminated sites is part of CNL’s proposal for the NSDF. Contamination on these sites will remain hazardous for centuries.

<http://www.sierraclub.ca/national/documents/tritium-on-tap.pdf>

If there are plans to bring radioactive waste from other areas to Chalk River how will this waste be transported? What safeguards would be in place for these transports against an accident or sabotage?

If there is an emergency how will the river be protected and how will communities downstream be protected?

Does the NSDF timeline make sense?

CNL has a 10-year contract after which CNL will no longer be responsible or have any liability. The NSDF will be operational for fifty years (until 2070). CNL calculates that the final cover should be in place on the mound by 2100 and the water treatment facility will then be decommissioned. Active control will end. Would active monitoring end as well? CNL writes that “inactive or passive institutional control will continue from 2100-2400”. What does this mean? The half-life of most radionuclides in intermediate-level wastes could extend far beyond 2400.

Will there be an emergency fund?

Dr. Ole Hendrickson believes that AECL and CNL should be required to establish a fund to pay for any future problems or leaks. According to CNL there will be \$1 billion available through a “combination of purchased insurance and indemnification from the Government of Canada”. Aside from the insurance portion, does this not mean that taxpayers will be liable?

First Nations’ Concerns

Several letters have been submitted to the CNSC by First Nations. They share the concern about contamination of this great river and want to ensure that “stringent environmental measures are in place to prevent and to mitigate any harmful impacts to surrounding lands and waters”.

<http://www.ceaa.gc.ca/050/documents/p80122/115399E.pdf>

Algonquins of Ontario - letter to CNSC sent in June 2016
<http://www.ceaa.gc.ca/050/documents/p80122/114851E.pdf>

Lies, Omissions and Nuclear Waste: The Chalk River Reactor and the Kichesipirini Algonquin (part one of three)
<http://www.dominionpaper.ca/articles/1749>

Manufactured Crises on Stolen Land: The Chalk River Reactor and the Kichesipirini Algonquin (part two of three)
<http://www.dominionpaper.ca/articles/1790>

An Eagle Feather for Linda Keen?: The question of jurisdiction (Part III in a series)
<http://www.dominionpaper.ca/articles/1845>

We believe that all citizens and communities should be made aware of what is transpiring on the shores of our great Ottawa River. Radioactive contamination could and would affect all people and all communities along the river all the way to Montreal and beyond.

Conclusion

Disposal of nuclear waste is one of the most serious challenges facing Canada. The focus of this document is on CNL's proposals and plans for the management of radioactive waste at the Chalk River site. This site is surrounded by the Ottawa River and Chalk River drainages. Questions are raised here about the risks associated with these proposals to the health and safety of people living along the Ottawa River and to the river and the environment.

The NRU reactor at Chalk River will close in March 2018. The decommissioning process will go on for years. Currently there seems to be no long-term plan for the storage of the highly radioactive waste associated with this reactor. This waste will be in interim storage until a long-term solution is found.

Also, it is not evident how the entire area around this NRU reactor, which has been contaminated by radioactive leaks over many years, will be resolved. An overall clean-up plan is missing.

CNL's proposal for a Near Surface Disposal Facility (NSDF) was filed in March 2016 for the long-term disposal of low-level radioactive waste and "mixed wastes" at Chalk River. The environmental assessment process commenced in May 2016. Intermediate-level radioactive waste was added to the proposal in October 2016. We have indicated in this document many of the concerns and

questions about this specific project that have been raised by environmentalists, experts and scientists.

Several aspects of this proposal for a NSDF are particularly objectionable. One is that radioactive waste will be brought to Chalk River from all over the country. Another is that it will contain both low and intermediate-level radioactive waste. A third is in regard to the size of the NSDF, as one million cubic metres is four times the recommended capacity for a low and intermediate-level waste facility. Chalk River is on the shore of the Ottawa River and is surrounded by water. The risk of a radioactive leak and the resulting consequences are too great.

Two other factors add to these concerns: first, the restructuring of the Atomic Energy of Canada Limited (AECL) which resulted in CNL being operated and managed by private companies and second, the changes made in 2012 to the Canadian Environmental Assessment Act so that the scope of the environmental assessment process was drastically reduced.

The environmental assessment must be stringent. Both Northwatch and the Canadian Environmental Law Association have called for AECL to be a co-proponent of the NSDF project and for the environmental assessment to be conducted by an independent review panel. These measures should be supported and demanded.

It is now up to all citizens and all levels of government to get information about this project and make their voices heard.

Help us to inform all citizens of the concerns and dangers of transporting radioactive waste and turning Chalk River into a huge radioactive disposal site on the banks of the Ottawa River.

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